

# Multimedia Lab Experience



## Lab 1: Site Selection

Students explore the soils in their region to identify a site of environmental and personal significance. This site will be the focus of their labs through the entire course.



- Videos
- Podcasts
- Field Exercises
- Computational work
- Online Soil Survey
- Traditional Lab reports



## Lab 5: Web Soil Survey

Using the USDA/NRCS Web Soil Survey, students learn how to combine field observations with Official Soil Series information to interpret their soil and identify viable land use activities.



## Lab 2: Profile Description and Soil Sampling

Students identify and describe the properties of horizons in their soil profile. Soil Texture has been one of the favorite activities in this lab exercise. Soil samples are collected for lab analyses.



## Lab 3: Infiltration/Percolation

Using readily available supplies, students study water movement by measuring infiltration and percolation rates in their soil.

## Lab 4: Soil Chemistry

Partial-size analysis and chemical analyses of the soil is made at the Penn State Agricultural Analytical Services Lab. Students interpret the results and calculate fertilizer recommendations for a specific crop.



## Necessity of Labs

We strongly felt that a hands-on laboratory experience is essential for an introductory soils course. Questions about the viability of laboratory exercises in an online environment were faced, the greatest of which was the students' ability to work independently to follow online instructions. With issues of the online environment in mind, we proceeded to develop the labs.

## Lab Implementation

Five Labs were developed that compliment the course readings and exams. Explicit step-by-step directions with many images, diagrams, and supplemental videos and worksheets are provided to guide the students through each laboratory. Students produce a report for each lab that includes digital photographs, and a write up with Introduction, Methods, Results, and Discussion. Students are graded using rubrics.

## Results and Future

The soil labs are often reported to be the students' favorite component of the course. Based on the quality of the lab reports and student evaluations, it is clear that the labs are effective educational experiences. Adjustments were made to each lab through the first few semesters to improve clarity to the diverse audience. Such adjustments are ongoing, but are now minor. We plan to continue updating the labs to keep them methodologically current, and make adjustments if demands for different material are evident.

# Shovels and Laptops: The Success of Hands-On Labs in Soils 101

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